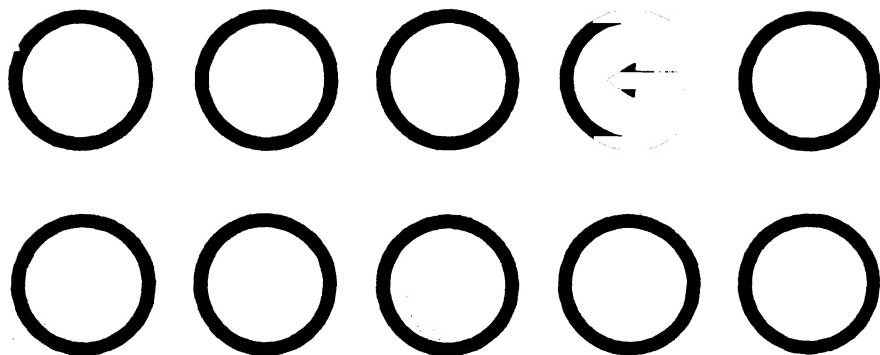


RESEARCH ABSTRACTS



RESEARCH CELL
ASSOCIATION OF INDIAN UNIVERSITIES
NEW DELHI

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Price : Rs. 14-00

**Published by the Association of Indian Universities Rouse Avenue,
New Delhi and Printed at Pearl Offset Press 5/33 Kirti Nagar,
Industrial Area, New Delhi 110015.**

PREFACE

The Examination Research Cell (ERC) of the Association of Indian Universities has been from time to time investigating into various fundamental issues of university examinations like Grading, Test and Item Analysis, Practical Examinations, Continuous Internal Assessment to mention only a few. Results of these research projects have already been reported in the form of Monographs, some of which have been revised in subsequent editions to include experiences of teachers/colleges/universities.

At the same time, a few research studies have been conducted and it was felt that a series of Research Abstracts should be brought out incorporating the results of such studies. The present Research Abstract is fourth in the series and it is exclusively to report the Examination result of test and item analysis of a test given by National Academy of Medical Sciences in their MNAMS Part I Examinations. What is reported here is an analysis of an objective type test of 150 items taken by 221 candidates.

A very comprehensive computer programme has been used to mark the scripts, to perform statistical analysis of the test and of various items and is also included in this Research Abstract.

It is hoped that teachers, examiners and other examining bodies will find this Research Abstract useful.

Constructive suggestions will be most welcome.

New Delhi
10th November, 1981

V. Natarajan

ACKNOWLEDGEMENTS

The Examination Research Cell is indebted to the Ministry of Education and Social Welfare for the financial support.

The Cell is grateful to Dr. G.S. Marwaha, President AIU, Dr. Amrik Singh, Secretary, AIU, Dr. Ram Reddy, Dr. Nanjundappa, Prof. Ram Joshi and Mr. Kolathkar, members of the Research Committee for their guidance and advice.

Mr. Ved Prakash, Miss Veena, Miss Asha Arora, and Mr. G. Ramakrishnan, Research Assistants, Mr. K.K. Giri, IBM Typist and Mr. V.K. Chugh, Steno have all helped in bringing out this abstract.

A special word of thanks is given to the National Academy of Medical Sciences & National Board of Examination, who supplied data for analysis and to Computronics India for processing the data through their computer.

**A COMPREHENSIVE STATISTICAL ANALYSIS OF
A SAMPLE OBJECTIVE TYPE TEST.**

USE OF OBJECTIVE TESTS

INTRODUCTION

Objective type tests in our country are increasingly being used to serve different purposes in different situations. A beginning of it was seen in class room tests by several teachers with the main purpose of checking learning and diagnosing the weaknesses of it. Soon its use has been extended as a part of summative evaluation to check on the levels of achievement at the end of a course of study. Very recently we have seen objective type tests being used in admission and selection type tests.

While the attempts to use objective forms of assessment, have not taken roots yet, many achievement tests purely of objective forms are used particularly by organisations wanting to select a few among the many achievers of the previous qualifying courses.

In the present context therefore, this objective type test used by the National Academy of Medical Sciences for their Part-I, M'NAMS examination, is a test of attainment or proficiency in the subject of medicine, being acquired by the candidates in their previous qualifying courses. Of course the content and the intellectual abilities and skills associated with this content were all sorted out by a group of experienced and expert item writers, before assembling a collection of nearly thousand multiple-choice type items at the end of a 2 week long workshop to produce such items. One hundred and fifty of these were selected on the basis of the table of specifications and put into this test.

This test therefore deals with a certain body of contents and related intellectual abilities involved in this. The main purpose of this test is to discriminate between the more able and less able candidates on the basis of performance in the test. It is therefore imperative that the items used in the test should have a high degree of discrimination.

There are two aspects of the whole test that need to be elaborated. One of these is the "validity" of the test. By this it is meant that the items used in the test measure the identified abilities in different areas of content in a balanced manner. This is done through a table of specifications or a blueprint that specifies weightages to different areas of content and also weightages to different abilities. This largely accounts for the content validity of the test. The second of these is "reliability". By this, it is meant that the test measures consistently whatever it measures. In other words, the reliability of the test is its ability to produce more or less the same score for the same individual candidate. No test is known to have a hundred percent reliability. The coefficient of reliability is estimated by different methods. Usually the most probable value of reliability can be estimated out of all these.

Some criteria used for the Construction and Administration of this objective test: Arrangement of Items:

One method is to arrange the items in order of difficulty, usually the difficulty increases (i.e. Facility Value/ F.V. decreases) as the test proceeds. It would probably be better to form groups of items, each group containing items of approximately equal facility, rather than to try to arrange them in a fine gradation of facility from start to finish. It is a common practice to put one or two easy items at the beginning of a test on the psychological grounds that they will give candidates confidence and put them at ease. It is sometimes arranged according to some other method and let facility take care of itself.

A more common and defensible practice is to arrange items in groups corresponding to some acceptable classification of subject matter. Another criterion is that items should be grouped according to their types. If there is more than one type of item used within the test. This way all multiple choice items would be grouped together, all multiple completion would be in another group, and so on. In a mixed objective type test, this grouping by item type is essential, or it becomes confusing for a student to move at random from one type of item to another. While considering the arrangement of items one should keep an eye on the sequence of keys, that is, the letters which denote the correct response. It is usually thought to be undesirable to have a prolonged run of identical keys such as a long sequence of 'A's or even a set pattern of responses to get repeated over the items.

Lay-Out of the Test :

Clarity of lay-out is important. It is easy enough for a student to become confused when dealing with a single complex item. It is possible to arrange items in a double column on each side of the paper but only if the items themselves are short and simple. Even then, the order and numbering of the items should be logical and consistent.

Recording the Responses

There are various ways in which the responses of the candidates can be recorded. In large scale examining the use of some form of answer (response sheet) is preferred. This answer sheet may either be given separately or be detached from the testbooklet. There are three main types of answer-sheet outlined briefly below but in all the three the use of a soft lead pencil is advocated because it facilitates correction if a candidate should have a change of mind.

- i) The first type of answer sheet requires to write the letter

or number corresponding to the chosen response to each item.
for example :

Blank Answer Sheet

1. ☐ 2. ☐
3. ☐ 4. ☐

Completed Answer Sheet

1. ☒ B 2. ☒ D
3. ☒ A 4. ☒ C

- ii) In the second type of answer sheet the candidate marks usually by a circle, or a cross or a tick, the letter or number corresponding to the chosen response. For example :

Blank Answer Sheet

1. A B C D
2. A B C D
3. A B C D

Completed Answer Sheet

1. (A) B C D
2. A B (C) D
3. A (B) C D

- iii) The third type is used mainly when tests are marked by machine. It requires candidates to fill in completely a small lettered or numbered space by means of a pencil mark. When fed through a scoring machine (Scanner), which can detect the positions of the pencil marks and which is programmed to distinguish between correct and incorrect scores, each answer-sheet is automatically scored. For example :

Blank Answer Sheet

- A B C D
1. O O O O
2. O O O O
3. O O O O

Completed Answer Sheet

- A B C D
1. O ● O O
2. O O O ●
3. ● O O O

The response pattern shown in (iii) has been used in this test.

Items Analysis :

Every item in a test should contribute something to the assessment one is trying to make. In order to see that every item does indeed carry part of the load, some statistical analysis is necessary. Analysis of test items not only helps us to identify poor items, but also decide why an item is not functioning as it was planned to do. The objective type items have an advantage over most other forms of questions that their performance under operational conditions can be quantitatively analysed and evaluated after they have been used.

Item analysis yields three indices that can be calculated for every individual item . These are :

- A) Facility Value (or Difficulty Value)
- B) Discrimination Index (or Discriminating power)
- C) Effectiveness of Distractors

A) Facility Value (or Difficulty Value) :

The facility value of an item indicates how easy or difficult it proved to be and it is determined by calculating the percentage of candidates who answered it correctly. It is usually shown as a percentage and rarely as a decimal fraction.

Total number of candidates who attempted the item (N) = 90

Number of correct responses to the item (R) = 63

$$\text{Facility of this item (FV)} = \frac{\text{Number of candidates answering the item correctly}}{\text{Total Number who attempted this item.}}$$

- i) if calculated in Percentage, $FV = \frac{R}{N} \times 100$
 $FV = \frac{63}{90} \times 100 = 70\%$
- ii) if calculated in decimal fraction, $FV = \frac{R}{N}$
 $FV = \frac{63}{90} = 0.70$

In actual practice, a range of difficulty is allowed, e.g. between 40 and 80 percent for four option multiple choice items and 55 and 85 percent for true/false items. These limits are admittedly arbitrary and are provided only as general guidelines. If tests are used to produce a rank order, every item in the test must have a certain amount of facility. An item which is either answered correctly or incorrectly by all does not serve any useful purpose. In one case the item is too easy while it is too difficult in the other. Therefore, it is advisable to avoid both the very difficult and the very easy items.

B) Discrimination Index (or Discriminating Power)

This statistic shows the degree to which a particular item

discriminates between the higher ability and lower ability candidates. For convenience ability is here defined in terms of how well students do the test as a whole. If a particular item is to contribute to the discriminatory function of the whole test, the higher ability candidates should obtain a greater proportion of correct responses than the lower ability candidates. There are several ways in which it can be quantified. However, a simple procedure to calculate the D.I. value is given below:

1. Arrange the students in rank order according to their scores on the test as a whole.
2. One third of answer scripts at the top and the one third at the bottom are to be separated. (Very often the top 27% of total number of students and the bottom 27% of total number of students are taken for purposes of accuracy of results)
3. For each item count the number of correct responses (N_H) obtained by the top third and count the number of correct responses (N_L) obtained by the bottom third. If 27% is adopted, count the number of correct responses obtained by the top 27% (N_H) and also count the number of correct responses obtained by the bottom 27%.
4. Count the number (n) of students constituting one third of all the students who took the test. (or number of students in 27%)
5. Calculate the discrimination of the item (DI) with the help of the following formula;

$$D.I. = \frac{N_H - N_L}{n}$$

For example :

$$\begin{aligned} n &= 30 \text{ (one third of all students)} \\ N_H &= 27 \text{ i.e. 27 out of 30 answered correctly} \\ N_L &= 15 \text{ i.e. 15 out of 30 answered correctly} \\ D.I. &= \frac{27-15}{30} = \frac{12}{30} =: 0.40 \end{aligned}$$

If top and bottom 27% are adopted, we get Johnson's upper-lower index of D.I.

It follows that if an item is to contribute to the total discriminatory power of the test, N_H must be greater than N_L and, therefore, DI must be positive. The two extremes would be :

$$\begin{aligned} \text{i) } n &= 30, N_H = 30, N_L = 0 \\ \text{therefore } DI &= \frac{30 - 0}{30} = +1 \end{aligned}$$

$$\begin{aligned} \text{ii) } n &= 30, N_H = 0, N_L = 30 \\ \text{therefore } DI &= \frac{0 - 30}{30} = -1 \end{aligned}$$

$$\begin{aligned} \text{iii) } n &= 30, N_H = 20, N_L = 20 \\ \text{therefore } DI &= \frac{20 - 20}{30} = 0 \end{aligned}$$

An explanation for each of the three above mentioned cases is given below:

- i) In this case the item is discriminating positively between the higher ability and the lower ability candidates and is making maximum contribution.
- ii) In this case the item is also discriminating totally but in the opposite direction; that is the higher ability candidates on the test as a whole are answering incorrectly and vice-versa.
- iii) In this case, the item is making no distinction between the higher ability and lower ability candidates; it is having neither a positive nor a negative effect on the discriminating power of the whole test.

With a view to make a thorough study of an objective type test on the lines mentioned above, a test with 150 items was tried out on a sample of 221 medical candidates. The details of the nature of the test and its analysis are given below:

Test Analysis

Subject Matter and
Nature of the test:

Medicine and Allied Sciences
MNAMS (Primary Paper-I)
Objective Test

Number of candidates:

221

Number of items:

150

Maximum Marks : 150

Time : 3.00 Hours

About the Test:

This is an objective type test. It consists of 150 items which are divided into three sections namely Section-'A', 'B' and 'C'.

Section - 'A'

This section contains seventy five items. Each item is of multiple-choice type and has got four suggested answers. Every item has one and only one predetermined correct answer.

Section - 'B'

This section contains forty eight items of multiple true-false type. The candidates were asked to indicate for each item whether the statement of the item is true or false.

Section - 'C'

This section contains twenty seven items. There are two statements given in each item. The first statement is in the form of an assertion while the second is in the form of a reason. The candidates were asked to choose the correct response indicating either 'A' or 'B' or 'C' or 'D' or 'E'. The candidates were given the following instructions:

- i) use 'A' if assertion is true, reason is true and reason is a correct explanation.
- ii) use 'B' if assertion is true, reason is true but reason is not a correct explanation of assertion.
- iii) use 'C' if assertion is true, reason is false.
- iv) use 'D' if assertion is false, reason is true.
- v) use 'E' if both assertion and reason are false.

With all these instructions the candidates were asked to shade the circle below the appropriate response on the answer-sheet.

Sample

The students who appeared for the part-I, MNAMS examination, were selected for studying the efficacy of the test and the efficiency of its items. A total population of 221 candidates was found suitable for the study.

Administration

An objective type test with 150 items was administered to a sample of 221 candidates. They were given 3.00 hours to complete the test. The candidates were asked to attempt all the 150 items of the test. The candidates were further told not to write anything on the testbooklet. Separate answer-sheets were provided to every candidate which were collected from them after the allotted time.

Scoring:

All the 221 answer-scripts were manually scored with the help of a scoring key especially designed for the test items. Each item was given 1 mark if it was correctly answered and zero mark if it was wrongly answered. In this manner all the 150 items were scored and their marks were tabulated for further analysis.

Data Analysis

The data were analysed with the help of various statistical techniques. Different values like mean, mode, median, standard deviation, variance and standard error of the mean were calculated. The reliability of the test by various methods was calculated. The data were also analysed with the help of analysis of variance technique to provide estimates of components of variation and to make valid conclusions. Derived scores in respect of Z-scores, T-scores, AGCT, CEEB scores and percentile ranks were also worked out for all the candidates in order to derive comparable scales. Items were also analysed to find out their facility and discrimination indices.

Interpretation of the Results:

The results of the test are interpreted in the following sequence:

1) Mean, Mode, Median and Standard Deviation

The scores obtained by the candidates are first of all arranged in an order (see table 1.0) to calculate some desired values.

The range of the marks secured by the candidates in this test is found to be between 46 and 111. The minimum marks obtained by the candidates are 46 and the marks 111. The mean value of the test is 78.9. It is seen from the range of the marks that a few candidates say only 9.5 percent of the total population, have secured 100 and more than 100 out of 150 marks. Half of the candidates have secured less than 51 percent marks on the test. The median of the test which indicates the middle candidate's score on the test is 77. It signifies that 77 is that point on the scale of measurement above which are exactly half the cases and below which are the other half and it seems of course very true if we look at the marks of the candidates. The mode of the test which indicates the maximum frequency in a distribution in this case happens to be exactly

similar to the median value. As many as nine candidates have secured 77 marks out of 150. The standard deviation of the test is 15. It indicates that a majority of the candidates have secured their marks in the range of 64 to 94 and this happens to be true. As many as 65 percent of the cases are found within this range. Only 19 percent of cases are found above and 16 percent of the cases are found below this range. It also signifies that the marks obtained by the candidates are normally distributed. The standard error of the mean of the test is 1.015 which indicates that the limits of marks within which the arithmetic mean will lie if we are to give this test over and over again would be only 1.015 or it signifies that the limit of tolerance of mean is 1.015. All these values are given in Table 1.1.

Table - 1.0
Frequency distribution of Marks⁺

<u>S.No.</u>	<u>Marks</u>	<u>Frequency</u>	<u>Cum Freq.</u>
1	46.00	2.00	2.00
2	50.00	1.00	3.00
3	51.00	4.00	7.00
4	53.00	4.00	11.00
5	54.00	2.00	13.00
6	55.00	2.00	15.00
7	56.00	2.00	17.00
8	57.00	1.00	18.00
9	58.00	2.00	20.00
10	59.00	3.00	23.00
11	60.00	4.00	27.00
12	61.00	3.00	30.00
13	62.00	1.00	31.00
14	63.00	3.00	34.00
15	64.00	4.00	38.00
16	65.00	5.00	43.00
17	66.00	8.00	51.00
18	67.00	5.00	56.00
19	68.00	6.00	62.00
20	69.00	4.00	66.00
21	70.00	6.00	72.00
22	71.00	6.00	78.00
23	72.00	5.00	83.00
24	73.00	1.00	84.00
25	74.00	6.00	90.00
26	75.00	7.00	97.00
27	76.00	6.00	103.00
28	77.00	9.00	112.00
29	78.00	4.00	116.00
30	79.00	2.00	118.00
31	80.00	2.00	120.00
32	81.00	3.00	123.00

<u>S. No</u>	<u>Marks</u>	<u>Frequency</u>	<u>Cum Freq.</u>
33	82.00	4.00	127.00
34	83.00	5.00	132.00
35	84.00	3.00	135.00
36	85.00	6.00	141.00
37	86.00	5.00	146.00
38	87.00	8.00	154.00
39	88.00	6.00	160.00
40	89.00	4.00	164.00
41	90.00	3.00	167.00
42	91.00	2.00	169.00
43	92.00	3.00	172.00
44	94.00	7.00	179.00
45	95.00	4.00	183.00
46	96.00	6.00	189.00
47	97.00	1.00	190.00
48	98.00	3.00	193.00
49	99.00	7.00	200.00
50	100.00	4.00	204.00
51	101.00	1.00	205.00
52	102.00	2.00	207.00
53	103.00	3.00	210.00
54	104.00	3.00	213.00
55	105.00	1.00	214.00
56	106.00	4.00	218.00
57	110.00	2.00	220.00
58	111.00	1.00	221.00

+Output from computer

Table of some desired statistics⁺

Table-1.1

Mean of Score	78.9005
Median of Score	77.0000
Mode of Score	77.0000
Variance of Score	226.9231
Standard Deviation	15.0640
S.D. by Dietrich Method	14.8288
Standard Error of the Mean	1.0156

+Output from computer

Percentile Ranking

A candidate's percentile rank describes his relative standing within a specified group. A percentile is one of the ninety-nine points dividing a frequency distribution into one hundred groups of equal size. The scores which serve to identify a person's status within a specified group may be expressed in a variety of forms. One convenient way of indicating the level of an individual's performance is to quote his percentile rank. This tells us what percentage of the group performed at a lower level. Thus if we compare an individual's mark with those obtained by the group as a whole, and find that when their marks are arranged in rank order he is exactly half way down the list, he would be said to be at the 50th percentile. In other words fifty percent of the group were below him in the list. If he fared better than 90 percent of the group he would have a percentile rank of 90 and so on.

It is clear that this is a much more meaningful representation of an individual's performance than his total mark or percentage mark in an examination. Table 1.1a shows the percentile rank calculations of all the 221 candidates.

Table 1.1a showing percentile rank calculation

S. No.	Marks(x)	Frequency(f)	Cumulative Freq. (Cf)	Cumulative Freq. mid- point (Cfm)	Cumulative Percentage of mid point (P. R.)
1	111	1	221	220.50	99.77
2	110	2	220	219.00	99.09
3	106	4	218	216.00	97.73
4	105	1	214	213.50	96.38
5	104	3	213	211.50	95.70
6	103	3	210	208.50	94.34
7	102	2	207	206.00	93.21
8	101	1	205	204.50	92.53
9	100	4	204	202.00	91.40
10	99	7	200	196.50	88.91
11	98	3	193	191.50	86.65
12	97	1	190	189.00	85.74
13	96	6	189	186.00	84.16
14	95	4	183	181.00	81.90
15	94	7	179	175.50	79.41
16	92	3	172	170.50	77.14
17	91	2	169	168.00	76.01
18	90	3	167	165.50	74.88
19	89	4	164	162.00	73.30
20	88	6	160	157.00	71.04

21	87	6	154	150.00	67.87
22	86	5	146	143.50	64.93
23	85	6	141	138.00	62.44
24	84	3	135	133.50	60.40
25	83	5	132	129.50	58.59
26	82	4	127	125.00	56.56
27	81	3	123	121.50	54.97
28	80	2	120	119.00	53.84
29	79	2	118	117.00	52.94
30	78	4	116	114.00	51.58
31	77	9	112	107.50	48.64
32	76	6	103	100.00	45.24
33	75	7	097	93.50	42.30
34	74	6	090	87.00	39.36
35	73	1	084	83.50	37.78
36	72	5	083	80.50	36.42
37	71	6	078	75.00	33.93
38	70	6	072	69.00	31.22
39	69	4	066	64.00	28.95
40	68	6	062	59.00	26.69
41	67	5	056	53.50	24.20
42	66	8	051	47.00	21.26
43	65	3	048	40.50	18.32
44	64	4	038	36.00	16.28
45	63	5	034	32.50	14.70
46	62	1	031	30.50	13.80
47	61	3	030	28.50	12.89
48	60	4	027	25.00	11.31
49	59	3	023	21.50	9.71
50	58	2	020	19.00	8.59
51	57	1	018	17.50	7.91
52	56	2	017	16.00	7.23
53	55	2	015	14.00	6.33
54	54	2	013	12.00	5.42
55	53	4	011	9.00	4.07
56	51	4	007	5.00	2.26
57	50	1	003	2.50	1.13
58	46	2	002	1.00	0.45

Reliability of the Test

The reliability of the test calculated by various methods is given below:

A. Split Halves Reliability

In this method the test of 150 items is split into two halves namely:

- a test of odd numbered items and a test of even numbered items.

Marks obtained by candidates in odd numbered item test and even numbered item test are all found out. Product moment correlation is worked out to give the split halves reliability.

- (ii) another way of making two tests out of one is to take any random 75 items and constitute into a test while the rest will be made into another. Candidate's marks on these two tests are found and product moment correlation found out.
- (iii) yet another way to have two halves of the same 150 items is to take the first 75 items as a test and last 75 as another. Candidates' marks on these first 75 and last 75 items are found and correlated.

Thus, all the 150 test items are divided into two halves by the three above mentioned methods and then the reliability by various methods is calculated. The different values are given in Table 1.2.

It is seen from Table 1.2 that the reliability of the test calculated by various methods is fairly high. In most of the cases, the reliability of the test is greater than 0.85 or approximately 0.89 which is of course a very high value for a test of this type. It further signifies that the test items are nearly equal in difficulty and hence the reliability of the test is quite high.

Table-1.2
Reliability of the Test⁺

	Split halves reliability	Spearman Brown whole test reliab- lity	Rulon Formula of reliability	Flanagan Formula of reliability
Odd even split	0.8080	0.8938	0.8907	0.8907
Random half split	0.5878	0.7404	0.7310	0.7310
First-second half	0.7740	0.8726	0.8719	0.8720
Reliability by Molser short cut method	= 0.8080			
Reliability by KR-20 formula	= 0.8753			
KR-I 20 form. Based on 27% HAG and 27% LAG	= 0.9284			
Another Form of KR-20 formula	= 0.8408			
Reliability by KR-21 formula	= 0.8408			
Cronbach Coeff. Alpha	= 0.8753			

Lower bound estimate of exam. reliability	= 0.9079
Stanley Approximation	= 0.8809
Index of Measurement efficiency	= 0.8942
Reliability by Analysis of Variance	= 0.8753
Tucker Modified KR form.	= 0.8753

+ Output from Computer

Analysis of Variance

The data were also analysed with the help of analysis of variance technique. for which the following hypotheses were developed:

Development of Hypotheses

In order to study the individual's marks on the test items and also to study the effect of test items on the individual candidates the following null hypotheses were formulated.

HO₁ The individual candidates will not vary significantly on the test items.

HO₂ The test items will not have any significant difference on the individuals' scores.

In order to test the hypotheses developed earlier, the analysis of variance technique was used to provide estimates of components of variation and to make valid conclusions. The summary of the complete analysis of variance is given in Table 1.3.

Table 1.3
Analysis of Variance

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares Error	Variance Ratio
Examinees	334.3359	220	1.5197	8.0177 ⁺
Items	1717.5039	149	11.5269	60.8139 ⁺
Remainder	6213.2344	32780	0.1895	

+ Significant at .05 and also at .01 level.

Analysis of Variance

To study the effect of individual student on the test items and also the effect of test items on individuals' scores, the data were analysed with the help of analysis of variance technique. The hypotheses which were formulated earlier were tested on the basis of the 'F' - values given in Table-1.3.

Hypothesis - I

This hypothesis states that the individual candidates will not vary significantly on the test items.

It is seen from Table 1.3 that the calculated value of 'F' in relation to examinees is greater ($F = 8.6177$) than the tabulated value, therefore, the null hypothesis is rejected. It means that the individual candidates differ significantly on the test items. The 'F' ratio for examinees is significant beyond the .01 point, leaving us with considerable confidence that the examinees difference, as such, have a real bearing upon the difficulty of the items of the test.

Hypothesis - II

This hypothesis states that the test items will not have any significant difference on the individuals' scores.

It is seen from Table 1.3 that the calculated value of 'F' in relation to items is greater ($F=60.8139$) than the tabulated value, therefore, the null hypothesis is rejected. It indicates that the test items have a significant difference on the individuals' scores. The F-ratio for items is significant beyond the .01 point, leaving us with considerable confidence that the items, as such, have a real bearing upon the individuals' scores.

Item Analysis

1. Facility Value(F. V.)

The facility value of an item indicates how easy or difficult it proved to be and is determined by calculating the percentage of candidates who answered it correctly. Usually the facility

value of an objective type test item must range from 20% to 85%. The various standards suggested to check the facility value of an objective type item are given below:

At trial test stage

0 to 25% F.V. Item is too hard (modify, check distractors)
 25% to 75% F.V. Item of correct facility
 75% to 100% F.V. Item is very easy (reword, reject, check for clues)

After trial but in actual use

0 to 25% topic not taught well/not learnt well
 (check teaching learning technique)
 25% to 75% topic reasonably taught well/learnt well
 75% to 100% exceptionally good knowledge of topic

2. Discrimination Index (D.I.)

This is an important item analysis characteristic for an objective type test item. The quality of an item in distinguishing between higher ability and lower ability candidates is technically called discrimination. The statistics showing discrimination value is called discrimination index. These indices range from - 1.0 to +1.0. A good quality item should discriminate between candidates who have achieved well and those who have not. The main purpose of discrimination index is to tell us if an item really is showing differences between more capable candidates and less capable candidates. The various standards suggested to check the discrimination index of an objective type item are given below:

0.6 and above: excellent items
 0.2 to 0.6: very good items
 0 to 0.2: needs improvement
 <0 to be discarded

Items with negative DI should be rejected.

The F.V. and D.I. for all the 150 items administered to a sample of 221 candidates were calculated, summarised and given in Table 3.0. The F.V. and D.I. values for individual items are separately given.

Qn. No.	% choosing Question	Mean Ability Index	Facility Value	Discrimination Index	Variance
94	100.0000	78.4208	0.9831	0.033898	0.008968
95	100.0000	72.2127	0.8559	0.220339	0.089638
96	100.0000	74.9050	0.9746	-0.016949	0.047296
97	100.0000	72.2851	0.9068	0.186441	0.089638
98	100.0000	51.0724	0.6271	0.203390	0.233389
99	100.0000	59.9050	0.7288	0.101695	0.189185
100	100.0000	31.8552	0.3898	0.542373	0.230953
101	100.0000	70.8959	0.8898	0.186441	0.103806
102	100.0000	48.9321	0.5932	0.576271	0.244426
103	100.0000	47.7466	0.5593	0.305085	0.242993
104	100.0000	57.6968	0.6864	0.288136	0.205729
105	100.0000	17.5204	0.2542	0.0	0.172560
106	100.0000	73.4887	0.9576	0.050847	0.067157
107	100.0000	50.1312	0.5932	0.508475	0.240536
108	100.0000	33.9140	0.4237	0.135593	0.242993
109	100.0000	4.3348	0.0847	-0.135593	0.059335
110	100.0000	62.9231	0.7966	0.372881	0.177515
111	100.0000	12.0090	0.1864	0.067797	0.123830
112	100.0000	47.8235	0.5847	0.288136	0.243730
113	100.0000	48.1584	0.6356	0.118644	0.239635
114	100.0000	40.1584	0.5424	-0.101695	0.249872
115	100.0000	69.0271	0.8559	0.254237	0.123830
116	100.0000	50.4389	0.6102	0.474576	0.239635
117	100.0000	42.3032	0.5169	0.423729	0.249954
118	100.0000	52.6516	0.6864	0.220339	0.228374
119	100.0000	33.3937	0.4831	0.050847	0.242993
120	100.0000	13.0724	0.1525	0.169491	0.130177
121	100.0000	27.3575	0.3305	0.288136	0.219652
122	100.0000	39.8959	0.5000	0.220339	0.249872
123	100.0000	63.7873	0.7712	0.186441	0.162159
124	100.0000	44.0814	0.5932	0.271186	0.248152
125	100.0000	32.5520	0.4068	0.305085	0.237710
126	100.0000	18.8461	0.2288	0.288136	0.170021
127	100.0000	22.9412	0.3136	0.457627	0.191397
128	100.0000	27.4027	0.3136	0.389830	0.216416
129	100.0000	31.6199	0.4407	0.101695	0.242993
130	100.0000	37.6832	0.5169	0.118644	0.24848
131	100.0000	20.0181	0.2203	0.033898	0.186933
132	100.0000	36.0633	0.3983	0.423729	0.244426
133	100.0000	33.1674	0.3729	0.203390	0.240536
134	100.0000	14.4118	0.1441	0.016949	0.148236
135	100.0000	15.0045	0.1610	0.152542	0.148236
136	100.0000	13.8462	0.1610	0.118644	0.139391

Qn. No.	% choosing Question	Mean Ability Index	Facility Value	Discrimination	Variance
137	100.0000	30.0090	0.4068	0.372881	0.228374
138	100.0000	42.5565	0.4915	0.474576	0.249954
139	100.0000	24.9955	0.2797	0.322034	0.207612
140	100.0000	16.9231	0.2373	0.135593	0.162159
141	100.0000	32.6244	0.4068	0.338983	0.236686
142	100.0000	33.7104	0.3898	0.305085	0.241396
143	100.0000	34.5475	0.3814	0.457627	0.240536
144	100.0000	26.1584	0.3051	0.372881	0.209455
145	100.0000	33.8054	0.4153	0.423729	0.240536
146	100.0000	12.2217	0.1525	0.135593	0.127024
147	100.0000	19.9955	0.3136	0.186441	0.182306
148	100.0000	21.4977	0.2712	0.271186	0.186933
149	100.0000	25.8145	0.3220	0.271186	0.213018
150	100.0000	11.6063	0.1864	0.203390	0.114003

+ Output from Computer.

If one looks at the F.V. and D.I. values of individual items which are given in Table 3.0 one finds there are a few items which need further improvement. Let us look at the F.V. and D.I. of all the items separately.

It is seen from Table 3.0 that there are twenty items in the test which have got high facility values. It signifies that these items are easy items and they are correctly answered by a large number of candidates. Against this there are twelve items which have got the least facility values. It shows that these are hard items and they are correctly answered only by a few candidates (that is why their facility values are less). It is therefore statistically proved that the items in the test are proportionately included. It shows an ideal combination of some easy, some hard and some medium items. In fact easy and hard items which are contrary to each other have approximately an equal load on the test as a result of which there is a very good balance. Majority of the items are of medium difficulty and this is a very good sign of a well planned test. On the basis of these statistics we can precisely say that this test out of 150 items contains 12 hard, 20 easy and 118 medium items, which of course seems to be a very good combination. From the psychological point of view we must have some easy items in the test (preferably in the beginning of the test) so that the candidates get some positive reinforcement by solving them. If one does not give the easy items in the test, the candidates may get nervous. Since we have to discriminate the candidates of higher ability and lower ability which is the first and the foremost purpose of the test, it is also necessary to include some hard items which could be solved only by the higher ability candidates. Apart from these two types of items i.e. hard items & easy items each test should have some items of medium difficulty.

If we look at the D.I. values of the items given in Table 3.0, it is seen that there are twenty five items which have got negative D.I. values. It means that these items have failed to serve their purpose or in other words these items have failed in discriminating between the higher ability and lower ability candidates. It further signifies that these items are either to be rejected or modified. Apart from it there are thirty items in the test which have got less D.I. values. It does not necessarily mean that these items are not at all good items and therefore they should be rejected. They need further improvement and it would be possible either by changing the distractors of the items or by converting or remodifying the stems of the items.

As a whole, the test is extremely good and it could be further improved if a few items which have shown less F.V. and D.I. values are slightly modified.

Derived Scores

It is necessary to convert the raw score scales into other standard scales for various reasons. One objective is to effect a more reasonable scale of measurement. Another important objective is to derive comparable scales for different tests. The raw scores from each test yield numbers that have no comparability with numbers from another test. There are many situations for

wanting not only comparable values from different tests but also values that have some standard meaning. These are the problems of test norms and test standards. It is almost certain that derived scores provide us with more nearly comparable values than do raw scores. No informed person would think of using raw scores as a basis of making direct comparisons among individual positions with respect to trait variables. Conversion of raw scores to values on some other common scale is essential. Derived scores in respect of Z, T, AGCT, CEEB are worked out for all the 221 candidates. Table 2.0 summarises the results of calculations.

1. Z-scores have 0 for their mean and 1 for their standard deviation
2. T-scores are linearly transformed Z scores with mean at 50 and S.D. at 10.
3. AGCT (100/20)
4. CEEB (College Entrance Examination Board) 500/100

Table 2.0 +

S. No	Marks	Z-score	T-score	AGCT-score	CEEB-score
1	111	2.13	71.31	142.62	713.09
2	110	2.06	70.64	141.29	706.45
3	110	2.06	70.64	141.29	706.45
4	106	1.80	67.99	135.98	679.90
5	106	1.80	67.99	135.98	679.90
6	106	1.80	67.99	135.98	679.90
7	106	1.80	67.99	135.98	679.90
8	105	1.73	67.33	134.65	673.26
9	104	1.67	66.66	133.32	666.62
10	104	1.67	66.66	133.32	666.62
11	104	1.67	66.66	133.32	666.62
12	103	1.60	66.00	132.00	659.98
13	103	1.60	66.00	132.00	659.98
14	103	1.60	66.00	132.00	659.98
15	102	1.53	65.33	130.67	653.34
16	102	1.53	65.33	130.67	653.34
17	101	1.47	64.67	129.34	646.70
18	100	1.40	64.01	128.01	640.07
19	100	1.40	64.01	128.01	640.07
20	100	1.40	64.01	128.01	640.07
21	100	1.40	64.01	128.01	640.07
22	99	1.33	63.34	126.69	633.43
23	99	1.33	63.34	126.69	633.43
24	99	1.33	63.34	126.69	633.43
25	99	1.33	63.34	126.69	633.43
26	99	1.33	63.34	126.69	633.43
27	99	1.33	63.34	126.69	633.43
28	99	1.27	63.34	126.69	633.43
29	98	1.27	62.68	125.36	626.79
30	98	1.27	62.68	125.36	626.79
31	98	1.27	62.68	125.36	626.79
32	97	1.20	62.02	124.03	620.15
33	96	1.14	61.35	122.70	613.51
34	96	1.14	61.35	122.70	613.51
35	96	1.14	61.35	122.70	613.51
36	96	1.14	61.35	122.70	613.51
37	96	1.14	61.35	122.70	613.51
38	96	1.14	61.35	122.70	613.51
39	95	1.07	60.69	121.37	606.87
40	95	1.07	60.69	121.37	606.87
41	95	1.07	60.69	121.37	606.87
42	95	1.07	60.69	121.37	606.87
43	94	1.00	60.02	120.05	600.24
44	94	1.00	60.02	120.05	600.24
45	94	1.00	60.02	120.05	600.24

S. No	Marks	Z-score	T-score	AGCT-score	CEEB-score
46	94	1.00	60.02	120.05	600.24
47	94	1.00	60.02	120.05	600.24
48	94	1.00	60.02	120.05	600.24
49	94	1.00	60.02	120.05	600.24
50	92	0.87	58.70	117.39	586.96
51	92	0.87	58.70	117.39	586.96
52	92	0.87	58.70	117.39	586.96
53	91	0.80	58.03	116.06	580.32
54	91	0.80	58.03	116.06	580.32
55	90	0.74	57.37	114.74	573.68
56	90	0.74	57.37	114.74	573.68
57	90	0.74	57.37	114.74	573.68
58	89	0.67	56.70	113.41	567.04
59	89	0.67	56.70	113.41	567.04
60	89	0.67	56.70	113.41	567.04
61	89	0.67	56.70	113.41	567.04
62	88	0.60	56.04	112.08	560.41
63	88	0.60	56.04	112.08	560.41
64	88	0.60	56.04	112.08	560.41
65	88	0.60	56.04	112.08	560.41
66	88	0.60	56.04	112.08	560.41
67	88	0.60	56.04	112.08	560.41
68	87	0.54	55.38	110.75	553.77
69	87	0.54	55.38	110.75	553.77
70	87	0.54	55.38	110.75	553.77
71	87	0.54	55.38	110.75	553.77
72	87	0.54	55.38	110.75	553.77
73	87	0.54	55.38	110.75	553.77
74	87	0.54	55.38	110.75	553.77
75	87	0.54	55.38	110.75	553.77
76	86	0.47	54.71	109.43	547.13
77	86	0.47	54.71	109.43	547.13
78	86	0.47	54.71	109.43	547.13
79	86	0.47	54.71	109.43	547.13
80	86	0.47	54.71	109.43	547.13
81	85	0.40	54.05	108.10	540.49
82	85	0.40	54.05	108.10	540.49
83	85	0.40	54.05	108.10	540.49
84	85	0.40	54.05	108.10	540.49
85	85	0.40	54.05	108.10	540.49
86	85	0.40	54.05	108.10	540.49
87	84	0.34	53.39	106.77	533.85
88	84	0.34	53.39	106.77	533.85
89	84	0.34	53.39	106.77	533.85
90	83	0.27	52.72	105.44	527.21
91	83	0.27	52.72	105.44	527.21
92	83	0.27	52.72	105.44	527.21
93	83	0.27	52.72	105.44	527.21
94	83	0.27	52.72	105.44	527.21
95	82	0.21	52.06	104.12	520.58
96	82	0.21	52.06	104.12	520.58

S. No	Marks	Z-score	T-Score	AGCT-Score	CEEB-Score
97	82	0.21	52.06	104.12	520.58
98	82	0.21	52.06	104.12	520.58
99	81	0.14	51.39	102.79	513.94
100	81	0.14	51.39	102.79	513.94
101	81	0.14	51.39	102.79	513.94
102	80	0.07	50.73	101.46	507.30
103	80	0.07	50.73	101.46	507.30
104	79	0.01	50.07	100.13	500.66
105	79	0.01	50.07	100.13	500.66
106	78	-0.06	49.40	98.80	494.02
107	78	-0.06	49.40	98.80	494.02
108	78	-0.06	49.40	98.80	494.02
109	78	-0.06	49.40	98.80	494.02
110	77	-0.13	48.74	97.48	487.38
111	77	-0.13	48.74	97.48	487.38
112	77	-0.13	48.74	97.48	487.38
113	77	-0.13	48.74	97.48	487.38
114	77	-0.13	48.74	97.48	487.38
115	77	-0.13	48.74	97.48	487.38
116	77	-0.13	48.74	97.48	487.38
117	77	-0.13	48.74	97.48	487.38
118	77	-0.13	48.74	97.48	487.38
119	76	-0.19	48.07	96.15	480.75
120	76	-0.19	48.07	96.15	480.75
121	76	-0.19	48.07	96.15	480.75
122	76	-0.19	48.07	96.15	480.75
123	76	-0.19	48.07	96.15	480.75
124	76	-0.19	48.07	96.15	480.75
125	75	-0.26	47.41	94.82	474.11
126	75	-0.26	47.41	94.82	474.11
127	75	-0.26	47.41	94.82	474.11
128	75	-0.26	47.41	94.82	474.11
129	75	-0.26	47.41	94.82	474.11
130	75	-0.26	47.41	94.82	474.11
131	75	-0.26	47.41	94.82	474.11
132	74	-0.33	46.75	93.49	467.47
133	74	-0.33	46.75	93.49	467.47
134	74	-0.33	46.75	93.49	467.47
135	74	-0.33	46.75	93.49	467.47
136	74	-0.33	46.75	93.49	467.47
137	74	-0.33	46.75	93.49	467.47
138	73	-0.39	46.08	92.17	460.83
139	72	-0.46	45.42	90.84	454.19
140	72	-0.46	45.42	90.84	454.19
141	72	-0.46	45.42	90.84	454.19

S. No	Marks	Z-score	T-score	AGCT-score	CEEB-score
142	72	-0.46	45.42	90.84	454.19
143	72	-0.46	45.42	90.84	454.19
144	71	-0.52	44.76	89.51	447.55
145	71	-0.52	44.76	89.51	447.55
146	71	-0.52	44.76	89.51	447.55
147	71	-0.52	44.76	89.51	447.55
148	71	-0.52	44.76	89.51	447.55
149	71	-0.52	44.76	89.51	447.55
150	70	-0.59	44.09	88.18	440.92
151	70	-0.59	44.09	88.18	440.92
152	70	-0.59	44.09	88.18	440.92
153	70	-0.59	44.09	88.18	440.92
154	70	-0.59	44.09	88.18	440.92
155	70	-0.59	44.09	88.18	440.92
156	69	-0.66	43.43	86.86	434.28
157	69	-0.66	43.43	86.86	434.28
158	69	-0.66	43.43	86.86	434.28
159	69	-0.66	43.43	86.86	434.28
160	68	-0.72	42.76	85.53	427.64
161	68	-0.72	42.76	85.53	427.64
162	68	-0.72	42.76	85.53	427.64
163	68	-0.72	42.76	85.53	427.64
164	68	-0.72	42.76	85.53	427.64
165	68	-0.72	42.76	85.53	427.64
166	67	-0.79	42.10	84.20	421.00
167	67	-0.79	42.10	84.20	421.00
168	67	-0.79	42.10	84.20	421.00
169	67	-0.79	42.10	84.20	421.00
170	67	-0.79	42.10	84.20	421.00
171	66	-0.86	41.44	82.87	414.36
172	66	-0.86	41.44	82.87	414.36
173	66	-0.86	41.44	82.87	414.36
174	66	-0.86	41.44	82.87	414.36
175	66	-0.86	41.44	82.87	414.36
176	66	-0.86	41.44	82.87	414.36
177	66	-0.86	41.44	82.87	414.36
178	66	-0.86	41.44	82.87	414.36
179	65	-0.92	40.77	81.54	407.72
180	65	-0.92	40.77	81.54	407.72
181	65	-0.92	40.77	81.54	407.72
182	65	-0.92	40.77	81.54	407.72
183	65	-0.92	40.77	81.54	407.72
184	64	-0.99	40.11	80.22	401.09
185	64	-0.99	40.11	80.22	401.09
186	64	-0.99	40.11	80.22	401.09
187	64	-0.99	40.11	80.22	401.09
188	63	-1.06	39.44	78.89	394.45
189	63	-1.06	39.44	78.89	394.45
190	63	-1.06	39.44	78.89	394.45
191	62	-1.12	38.78	77.56	387.81

S. No	Marks	Z-score	T-score	AGCT-score	CEEB-score
192	61	-1.19	38.12	76.23	381.17
193	61	-1.19	38.12	76.23	381.17
194	61	-1.19	38.12	76.23	381.17
195	60	-1.25	37.45	74.91	374.53
196	60	-1.25	37.45	74.91	374.53
197	60	-1.25	37.45	74.91	374.53
198	60	-1.25	37.45	74.91	374.53
199	59	-1.32	36.79	73.58	367.89
200	59	-1.32	36.79	73.58	367.89
201	59	-1.32	36.79	73.58	367.89
202	58	-1.39	36.13	72.25	361.26
203	58	-1.39	36.13	72.25	361.26
204	57	-1.45	35.46	70.92	354.62
205	56	-1.52	34.80	69.60	347.98
206	56	-1.52	34.80	69.60	347.98
207	55	-1.59	34.13	68.27	341.34
208	55	-1.59	34.13	68.27	341.34
209	54	-1.65	33.47	66.94	334.70
210	54	-1.65	33.47	66.94	334.70
211	53	-1.72	32.81	65.61	328.06
212	53	-1.72	32.81	65.61	328.06
213	53	-1.72	32.81	65.61	328.06
214	53	-1.72	32.81	65.61	328.06
215	51	-1.85	31.48	62.96	314.79
216	51	-1.85	31.48	62.96	314.79
217	51	-1.85	31.48	62.96	314.79
218	51	-1.85	31.48	62.96	314.79
219	50	-1.92	30.81	61.63	308.15
220	46	-2.18	28.16	56.32	281.59
221	46	-2.18	28.16	56.32	281.59

+ Output from computer

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0001 [MIFGPGPHQ
0002 WFA(OT,WQDQ,WQZT,WQZT
0003 0TMEH8[0TMEH8(15),WQD(221),0(150),1(221),150),C(221),150),0T(221),0
1(221),1(221),C(221),0)W(221),W(221),W(221),1(150),1(150),C(
15)
250),W(150),WQD(150),0P(150),1(221),C(221),W(221),0CP(
17(221),C(150),C(150),AT(150),1(150),0(150),C(150),C(150),C(
15)
0004 0P(150),1P(150),1(150),1(150),0P(150),C(150),1(150),1(221),1(221)
0005 0A100,W(221),150)
0006 0ATA 0(150),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(221),0P(
0007 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0008 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0009 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0010 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0011 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0012 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0013 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0014 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0015 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0016 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0017 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0018 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0019 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0020 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0021 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0022 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0023 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0024 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0025 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0026 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0027 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0028 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0029 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0030 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0031 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0032 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0033 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0034 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0035 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0036 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0037 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0038 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0039 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0040 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0041 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0042 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(
0043 0ATA 0(150),W(221),0P(150),W(221),0P(150),1(221),C(150),1(221),0P(150),W(

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0044      JF(T(I,J),EQ,M)GOTO0
0045      CM(I,J)=0.
0046      GOTO7
0047      H      CM(I,J)=1.
0048      GO TO 7
0049      9      CM(I,J)=2.
0050      7      CONTINUE
0051      DO10J=1,N
0052      DO10J=1,M
0053      IF(CM(I,J),FO,2,IGOTO10
0054      RT(I)=RT(I)+CM(I,J)
0055      CONTINUE
0056      DO11I=1,N
0057      DO12J=1,M,2
0058      IF(CM(I,J),FH,2,IGOTO12
0059      RT(I)=RT(I)+CM(I,J)
0060      CONTINUE
0061      11      RT(I)=RT(I)-RT(I)
0062      L=H/2
0063      DO13I=1,N
0064      DO14J=1,L
0065      IF(CM(I,J),FO,2,IGOTO14
0066      FH(I)=FH(I)+CM(I,J)
0067      CONTINUE
0068      13      A1=H(I)*RT(I)-FH(I)
0069      DO15I=1,N
0070      DO16J=1,L
0071      K=IPAN(I)
0072      JF(CM(I,K),FO,2,IGOTO16
0073      RW(I)=RW(I)+CM(I,K)
0074      CONTINUE
0075      16      WWH(I)=RT(I)-RW(I)
0076      PRINTEQ0
0077      PRINTEQ122
0078      50122      F0RMATF2Y,'X,N0','2X,'001L','01',4Y,'TOTAL',5X,'0100=FVP',8X,'FUS
IT=SFCONW',5X,'RANPCW=HAI',//)
0079      DO54I=1,M
0080      50121      PRINTEQ01,{,      RT(I),RT(I),RT(I),FH(I),A1=H(I),WH(I),WW(I)
0081      5011      F0RMATF2Y,(2Y,1Y,10X,1Y,F5.1,5F2F2Y,F4.01,X4)
0082      CALL F0R(FH,N,A1,M,AK2,VF,VAI,VDP)
0083      CALL F0R(RT,N,OT,AK3,VT,VN,VDA)
0084      CALL F0R(OT,N,ET,AK1,VN,VF,VMI)
0085      CALL F0R(DH,N,RWH,AK3,VRH,VBN,VN)
0086      JMI=1
0087      JMI=1
0088      SMAZRT(I)
0089      R1=RT(I)
0090      DO90I=1,2,N
0091      IF(RT(I),GT,HIG)GOTI9002
0092      IF(RT(I),LT,SMA)GOTI9001
0093      GOTI9001
0094      RTG=RT(I)
0095      JMI=1
0096      GOTI9001
0097      9001      SMA=RT(I)
0098      JMI=1
0099      9001      CONTINUE
0100      JMI=JTM

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0101  SMOBWA
0102  MUBBWA(10)
0103  MUBBWA(10)
0104  MUBBWA(10)
0105  MUBBWA(10)
0106  MUBBWA(10)
0107  MUBBWA(10)
0108  MUBBWA(10)
0109  MUBBWA(10)
0110  MUBBWA(10)
0111  MUBBWA(10)
0112  MUBBWA(10)
0113  MUBBWA(10)
0114  MUBBWA(10)
0115  MUBBWA(10)
0116  MUBBWA(10)
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0118  MUBBWA(10)
0119  MUBBWA(10)
0120  MUBBWA(10)
0121  MUBBWA(10)
0122  MUBBWA(10)
0123  MUBBWA(10)
0124  MUBBWA(10)
0125  MUBBWA(10)
0126  MUBBWA(10)
0127  MUBBWA(10)
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0130  MUBBWA(10)
0131  MUBBWA(10)
0132  MUBBWA(10)
0133  MUBBWA(10)
0134  MUBBWA(10)
0135  MUBBWA(10)
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0147  MUBBWA(10)
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0149  MUBBWA(10)
0150  MUBBWA(10)
0151  MUBBWA(10)
0152  MUBBWA(10)
0153  MUBBWA(10)
0154  MUBBWA(10)
0155  MUBBWA(10)

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0259      DO UNTIL(SH1,SH2,SH3)
0260      DO UNTIL
0261      71      FORMAT(5Y,'S. DU NN FORMULA OF REFLECTIVITY',/)
0262      DO UNTIL(SH1,SH2,SH3)
0263      DO UNTIL
0264      72      FORMAT(5Y,'S. FLANGANS FORMULA OF REFLECTIVITY',/)
0265      DO UNTIL(SH1,SH2,SH3)
0266      DO UNTIL(SH1,SH2,SH3)
0267      DO UNTIL(SH1,SH2,SH3)
0268      73      FORMAT(5Y,'S. REFLECTIVITY OF WATERSHEDS')
0269      C      INTERNAL FORMULAS OF REFLECTIVITY ESTIMATES
0270      SH1=
0271      SH2=
0272      SH3=
0273      L1=AN*27./100.
0274      AAL=L1
0275      DO UNTIL(SH1,SH2,SH3)
0276      DO UNTIL(SH1,SH2,SH3)
0277      DO UNTIL(SH1,SH2,SH3)
0278      DO UNTIL(SH1,SH2,SH3)
0279      DO UNTIL(SH1,SH2,SH3)
0280      DO UNTIL(SH1,SH2,SH3)
0281      DO UNTIL(SH1,SH2,SH3)
0282      DO UNTIL(SH1,SH2,SH3)
0283      DO UNTIL(SH1,SH2,SH3)
0284      DO UNTIL(SH1,SH2,SH3)
0285      DO UNTIL(SH1,SH2,SH3)
0286      DO UNTIL(SH1,SH2,SH3)
0287      DO UNTIL(SH1,SH2,SH3)
0288      DO UNTIL(SH1,SH2,SH3)
0289      DO UNTIL(SH1,SH2,SH3)
0290      DO UNTIL(SH1,SH2,SH3)
0291      DO UNTIL(SH1,SH2,SH3)
0292      DO UNTIL(SH1,SH2,SH3)
0293      DO UNTIL(SH1,SH2,SH3)
0294      DO UNTIL(SH1,SH2,SH3)
0295      DO UNTIL(SH1,SH2,SH3)
0296      DO UNTIL(SH1,SH2,SH3)
0297      DO UNTIL(SH1,SH2,SH3)
0298      DO UNTIL(SH1,SH2,SH3)
0299      DO UNTIL(SH1,SH2,SH3)
0300      DO UNTIL(SH1,SH2,SH3)
0301      DO UNTIL(SH1,SH2,SH3)
0302      DO UNTIL(SH1,SH2,SH3)
0303      DO UNTIL(SH1,SH2,SH3)
0304      DO UNTIL(SH1,SH2,SH3)
0305      DO UNTIL(SH1,SH2,SH3)
0306      DO UNTIL(SH1,SH2,SH3)
0307      DO UNTIL(SH1,SH2,SH3)
0308      DO UNTIL(SH1,SH2,SH3)
0309      DO UNTIL(SH1,SH2,SH3)
0310      DO UNTIL(SH1,SH2,SH3)
0311      DO UNTIL(SH1,SH2,SH3)
0312      DO UNTIL(SH1,SH2,SH3)
0313      DO UNTIL(SH1,SH2,SH3)
0314      DO UNTIL(SH1,SH2,SH3)
0315      DO UNTIL(SH1,SH2,SH3)

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0316      RM=SQ*(CR(I)+CR(J))/(AM+AM)
0317      XP=SQ/AM
0318      XN=SQ/AM
0319      VARP=(SQ-AM*XP*XP)/AM
0320      TMS=AM*(VT-AM*XP*SQ+AM*VARP)/(VT*(AM-1.))
0321      KR21=AM*(VT-AM*XP*SQ)/(AM-1.)*VT
0322      COEFF=AM*(VT-KR21)/(AM-1.)*VT
0323      C
0324      QUESTION ANALYSIS TABLE
0325      SUM=1
0326      DNO=1,M
0327      DNO=1,M
0328      IF(CM(I,J).EQ.2.)*GOTO97
0329      C(J)=C(J)+1
0330      IF(CM(I,J).EQ.1.)*I(J)=I(J)+1*RT(I)
0331      CONTINUE
0332      CT(I)=C(J)+100./AM
0333      AI(I)=AI(I)/C(J)
0334      FT(I)=C(RP7(I)+ACRP27(I))/(2.*AI(I))
0335      OT(I)=C(RP7(I)+ACRP27(I))/AI(I)
0336      SW=SQ*OT(I)*SQRT(VVAR(J))
0337      SINDSUD*OT(I)
0338      SFF=SQ*FT(I)/100.
0339      SFF=SQ*FT(I)*OT(I)/10000.
0340      CONTINUE
0341      ACOFF=AM*(1.-SQ/(SQ+SW))/(AM-1.)
0342      SAT=AM*(1.-A.*(SFF-SFF2)/SIND)/(AM-1.)
0343      ATMF=1.-C*(1+AM)/VT
0344      PRINT100,KR20,KR27,AKR20,KR21,COFF,ACOFF,RATR,ATMF
0345      FORMAT(///,5X,'REFLECTIVITY BY KP=20 FORMULA',10X,F10.4,/,5X,'KP=1
100 20 FORM. RATED ON 27X MAG AND 27X LAG',2X,F10.4,/,5X,'ANOTHER FORM
2 OFKX=20 FORM.',1X,F10.4,/,5X,'REFLECTIVITY KP=21 FROM.',1X,F10
1,4,/,5X,'CONTRACT COEFF ALPHA',2X,F10.4,/,5X,'LOWE BOUND ESTIMAT
DE OF EXAM REFLECTIVITY',10X,F10.4,/,5X,'TANLEY APPROXIMATION ',2X
4,F10.4,/,5X,'INDEX OF MEASUREMENT EFFICIENCY',F25.4,///)
0346      PRINTAN668,SAV,TMRK
0347      A6680 FORMAT(5X,'REIJAILITY ANALYSIS OF VAW.',2X,F15.4,/,5X,'THICKP
1 MONITOR K=R FROM.',2X,F15.4,///)
0348      PRINTA00
0349      PRINT500
0350      PRINT101
0351      FORMAT(///,15X,'QUESTIONS ANALYSIS TABLE',///)
0352      PRINTA00
0353      PRINT102
0354      FORMAT(1X,'ON. NO',2X,'ECONOMICS',2X,'MEAN ANTLITY',2X,'FACILITY'
1,2X,'DISCRIMINATION',2X,'VARIANCE',1X,'NO',2X,'QUESTION',6X,'INDEX'
2,///)
0355      PRINTA00
0356      D11031,M
0357      PRINT104,I,C(I),A(I),F(I),D(I),VVAR(J)
0358      FORMAT(14,F12.4,2F12,4,2X,2F15.6)
0359      PRINTA00
0360      PRINTA00
0361      PRINT109
0362      FORMAT(25X,'DERIVED SCORE TABLE',///)
0363      PRINTA00
0364      PRINTA00
0365      FORMAT(///,2X,'S.NO.',2X,'MARKS',2X,'ZSCORE',2X,'T-SCORE',2X,'AGG
11-SCORE',2X,'CEFB=SCORE',////)

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KFY RFSOJMSF HCHODHDAACAHOCACAAADPDACFCRHRHDGADWDAGAPABDAAAID
ADHOCFHWHWQDFADABIOBDCCFFEFTEIIFETEFYITEITETEIT
TETETETETETETETETETETAADDCCECFCECOBDBCFCDGFHC

[illegible]

[illegible]

[illegible]

[illegible]

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110	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
111	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
112	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
113	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
114	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
115	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
116	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
117	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
118	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
119	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
120	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
121	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
122	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
123	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
124	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
125	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
126	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
127	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
128	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
129	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
130	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
131	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
132	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
133	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
134	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
135	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
136	A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X		

[illegible]

[illegible]

212 A C C E D A H 4 A D D C H D D A H C A R A C H D D D H C A D A C A A F C R D C A F F D D D D D A H H D C
 D D H H H D H A H A D D D D D D D D D D C C C C C F T T T T T F T T T T T F F F F F T T T T F F
 F I F F T T T F F F F T T F T T T T T F T F F C E A A A F C H R C E D E A C A C A E A A D D C A A A A A D
 213 9 C H D C A D D H C A D H C A D A A A C D D 9 4 A H R C D C H R C A D E A H C A C A C D D D A R F F T F T F
 H C H A C C R D H C F T F F T T T T A D D T T F C C E D C A C C E L C C A E H D H C E C E D H E C C H H A
 T F F T F T F F F F F F T T T T A H C C C C H C C C A A D D D A H D A A A C A D D
 214 H C D A R C H A C D H A D A A C A C A C D D A H C C C H C C C A A D D D A H D A A A C A D D
 A C B R D C D D H C D A C A R D A A A D C A A C T T T - - - T T F T F F - T - - - T F T T F T F
 T I - F T T - F T F F - - - - T - - T - F C E F H A A C F A A H D D D C R F A - - - D E A A F E C A
 215 R A C D H D H C A C A C A H D D C A H D D A H C C D H C H R C D D C D A A H R H A C H A D D
 D A H A R C H D C A D A A D D H D A D D C C - T T T T T F - - - F T F T - - - T F - T - - -
 T F F - T T F T - C T F F - - - I - T F T C A F C A C C C C C E C D C - C C C C D E A F C R
 216 H D C D D C H D A H A A D A A C C A H D D A C R C A C A C D D D H D A H C C C A R C H A D D
 A A H H C D D A A A D D H C D D D H D H D D C C - - - T F T F F - - - T A T T F T F T - - -
 I - - - - - T - - F F - T F - - - - - T A A F R A A H F F C C C A C C R C D H R F C D
 217 H C R D R D H C H C A H A A F A D A H D D R H A C D H C C H A D D D A B R H A A H A A D D
 D A H A C C A C C H H C C A D A A D H D D C C T T F F T T F C F T F T F T T F T F T T
 T F F T T T F T F T F F A T F F T T F T F A C H C C C F A C A F D A - A E H A A C C C H C A A
 218 H A D D D H A A A A C H D D A C A C A H D D A C B C D H D C A F H 5 4 D D D H H R H 9 H A D D
 A A R A C C H D A C C D H C D D A A D H A C D D D F T T F T T T F F F F F F T T F T - F F T I
 T F - T T T F F F F F F T - F T F F T - A H F A F A A A A A A E R A D D C A C C A
 219 A C D C H D H A C C D A H D A C C A C A C D D H A H C C D A C R C H D F A A H D A C C H A H D H
 D D H C C C A D H C A D A C C D C A H D D C C C F T T F F T T F F T T F T F T T - T F
 T F F T T T T T C T T F F F F F T T F T T A C F C C A C C A A A F F A A A C A D E O F A E A
 220 C D H C A D H D C C C A H A A C A C C D D H A C D D H C H D C D C R D A H A H C A D D
 A D H C D D A C A R H C A A A D H D A D D F T T T T F F T T F T T T F T T F T T F F
 T F T T T T T F C T T T T F T T F F T T A A A C C C C A C C A D D A H C C C D D C H D F E A
 221 C D C D D D H D C C C A H D A C A C A A D D D H C C C D 9 9 H C A D D A C C C D D C H D F E A
 A C H R H C R D C C H C C C D H D A D D C H F T T T T T F T F T F T F T F T T F T F T F
 T F T T T T T F F T F T F T F T T T F T A D C A C A C C A C A F H - B A R D D F A C C A C

S. NO. ROLL NO. TOTAL MARKS PERCENTAGE MARKS

1	27	96	51	53	34	51	46
2	48	40	48	48	50	17	51
3	50	51	25	25	20	11	25
4	51	25	28	28	28	27	28
5	47	47	47	47	47	47	47
6	16	26	21	20	22	26	22
7	75	36	36	36	36	45	31
8	46	40	47	45	41	46	46
9	25	46	46	46	46	40	46
10	76	31	36	36	37	35	36
11	40	31	36	36	31	36	31
12	77	42	45	41	36	40	35
13	46	36	28	30	37	37	28
14	46	47	41	50	46	55	46
15	46	45	45	45	45	46	45
16	75	38	42	41	40	46	35
17	70	39	42	45	31	40	36
18	40	50	40	46	46	52	37
19	62	45	32	31	31	35	28
20	45	47	41	48	47	46	46
21	47	45	42	42	35	45	41
22	45	40	46	45	40	45	46
23	36	46	50	50	46	50	46
24	100	42	42	40	42	55	41
25	71	42	37	41	38	35	46
26	61	38	45	40	41	41	40
27	50	31	28	26	35	45	31
28	75	38	37	47	24	31	40
29	40	41	48	51	46	46	45
30	46	40	41	40	35	40	35
31	55	20	26	26	26	42	25
32	40	31	20	32	24	35	27
33	48	47	41	48	40	45	45
34	71	37	36	36	36	46	35
35	76	40	35	37	36	47	46
36	45	35	30	32	33	35	36
37	50	45	41	37	22	40	26
38	41	31	30	28	35	40	31
39	46	46	46	46	46	46	46
40	75	40	46	46	45	41	45
41	45	48	47	41	41	40	45
42	45	36	20	36	31	38	27
43	100	46	46	46	46	46	46
44	47	40	41	46	36	40	45
45	47	27	45	28	29	46	25
46	46	36	32	40	26	45	36
47	41	28	27	40	37	28	25
48	55	28	25	26	28	46	25
49	55	25	41	26	26	26	25
50	100	46	40	45	45	45	46
51	72	38	36	36	37	36	46
52	42	36	40	46	37	46	46
53	77	36	42	43	36	40	37
54	75	36	36	36	46	46	46
55	40	47	45	50	40	45	46
56	47	43	40	46	45	52	35
57	46	47	40	50	46	46	42
58	40	27	27	40	24	26	26
59	76	37	31	52	26	40	41
60	76	30	47	45	45	46	46
61	40	40	45	42	42	47	37
62	76	36	42	45	45	45	45
63	46	20	37	31	36	41	35
64	77	42	35	46	36	46	37
65	42	41	46	52	47	45	45

A6	A0	39	41	27	18	17	43
A7	A7	39	48	45	42	44	43
A8	08	45	51	53	45	40	49
A9	05	44	40	44	46	44	40
T0	51	25	24	23	28	29	27
T1	40	34	33	42	27	37	32
T2	44	33	33	34	30	32	30
T3	44	30	45	49	34	40	40
T4	94	40	44	37	43	47	43
T5	34	37	40	30	37	42	34
T6	A9	40	40	43	41	40	35
T7	00	45	54	54	45	50	40
T8	10A	51	55	41	45	54	54
T9	77	34	34	45	27	37	35
A0	77	43	34	40	37	40	37
A1	61	30	31	31	30	35	24
A2	74	37	33	40	30	34	32
A3	75	35	40	30	34	40	35
A4	44	31	24	34	24	35	24
A5	41	44	44	43	44	44	41
A6	40	32	32	34	24	32	32
A7	44	45	41	44	42	44	40
A8	71	40	31	44	25	34	33
A9	44	24	27	24	24	24	24
00	47	41	47	44	43	40	40
01	72	34	34	45	27	30	34
02	74	40	34	40	34	43	33
03	77	34	30	44	31	40	37
04	71	33	34	34	33	35	34
05	73	34	34	30	34	40	33
06	44	35	33	33	35	35	33
07	64	33	27	27	33	31	24
08	47	32	35	24	34	35	32
09	74	32	34	37	33	35	34
100	47	34	33	34	24	34	24
101	75	34	37	30	34	40	34
102	110	45	45	54	42	55	45
103	103	40	44	44	47	55	44
104	44	44	52	34	44	41	45
105	44	45	40	44	43	44	45
106	94	47	49	51	45	44	44
107	41	40	41	27	34	40	37
108	11	52	49	57	44	54	53
109	71	35	34	34	32	34	37
110	44	34	34	40	24	51	25
111	50	30	25	33	24	33	24
112	44	40	44	53	34	44	40
113	70	41	34	27	32	40	30
114	114	51	40	40	51	57	53
115	47	45	44	25	41	45	39
116	43	42	41	44	41	41	42
117	73	44	35	24	34	35	34
118	75	34	45	41	34	37	34
119	44	41	47	51	34	47	41
120	74	37	40	34	40	40	37
121	45	40	45	44	39	47	34
122	104	40	57	54	52	53	53
123	47	44	47	45	32	40	43
124	43	33	34	34	29	31	37
125	72	30	34	30	42	37	34
126	45	30	31	29	34	34	29
127	51	25	24	31	20	20	22
128	40	42	52	55	34	47	37
129	102	51	51	54	44	40	51
130	44	24	37	34	27	30	27
131	44	34	44	22	34	39	41
132	44	44	42	53	37	41	34
133	45	44	45	45	40	40	34
134	54	24	24	24	30	24	24
135	105	44	54	54	52	44	52
136	102	43	20	40	44	45	47
137	104	34	42	54	45	53	47

138	82.	39.	43.	47.	55.	51.	41.
139	60.	51.	29.	40.	20.	53.	27.
140	77.	40.	37.	42.	15.	58.	39.
141	51.	28.	25.	34.	19.	28.	25.
142	63.	35.	28.	22.	41.	32.	41.
143	58.	27.	31.	37.	21.	29.	20.
144	47.	43.	40.	47.	40.	44.	41.
145	46.	46.	50.	51.	45.	47.	49.
146	76.	39.	37.	49.	27.	42.	34.
147	49.	41.	48.	42.	47.	40.	45.
148	66.	35.	31.	34.	32.	38.	42.
149	48.	43.	45.	49.	39.	45.	33.
150	45.	30.	35.	47.	18.	39.	26.
151	95.	48.	47.	53.	42.	51.	49.
152	56.	28.	34.	29.	37.	29.	37.
153	51.	29.	32.	28.	33.	36.	24.
154	68.	35.	33.	29.	30.	33.	35.
155	47.	44.	41.	48.	39.	49.	38.
156	74.	32.	42.	40.	38.	34.	44.
157	90.	50.	40.	42.	47.	50.	49.
158	78.	39.	30.	45.	33.	47.	41.
159	92.	45.	47.	53.	39.	50.	48.
160	104.	51.	55.	63.	41.	52.	54.
161	86.	43.	43.	45.	41.	49.	37.
162	68.	28.	34.	32.	32.	33.	31.
163	86.	43.	43.	47.	31.	41.	45.
164	101.	51.	50.	64.	45.	54.	47.
165	98.	47.	52.	64.	33.	48.	51.
166	96.	36.	30.	44.	30.	49.	34.
167	77.	43.	44.	38.	39.	42.	35.
168	100.	47.	53.	64.	40.	53.	47.
169	88.	49.	30.	46.	34.	49.	34.
170	79.	40.	39.	49.	39.	49.	35.
171	106.	49.	54.	69.	40.	53.	42.
172	72.	35.	37.	38.	34.	40.	32.
173	94.	40.	47.	48.	48.	52.	40.
174	77.	37.	40.	46.	32.	38.	29.
175	99.	47.	52.	52.	47.	48.	43.
176	94.	51.	43.	50.	44.	44.	49.
177	91.	41.	44.	51.	40.	50.	41.
178	78.	30.	30.	34.	30.	34.	28.
179	103.	52.	51.	68.	43.	58.	45.
180	68.	34.	33.	32.	34.	39.	29.
181	68.	34.	38.	34.	30.	35.	33.
182	71.	34.	34.	40.	31.	40.	32.
183	44.	21.	22.	22.	24.	24.	20.
184	53.	23.	14.	26.	24.	28.	25.
185	69.	34.	30.	39.	30.	35.	33.
186	49.	34.	35.	31.	38.	35.	30.
187	99.	44.	48.	51.	43.	51.	43.
188	88.	45.	43.	38.	40.	38.	40.
189	104.	44.	54.	64.	51.	51.	45.
190	75.	34.	47.	38.	37.	39.	34.
191	64.	24.	35.	30.	26.	33.	41.
192	70.	34.	34.	42.	32.	40.	39.
193	92.	44.	44.	45.	47.	48.	40.
194	42.	30.	43.	33.	39.	31.	41.
195	74.	34.	40.	34.	34.	39.	47.
196	47.	37.	40.	30.	28.	42.	25.
197	95.	44.	47.	47.	48.	48.	47.
198	70.	45.	34.	42.	24.	40.	31.
199	41.	44.	41.	40.	32.	45.	44.
200	54.	21.	20.	21.	29.	24.	27.
201	84.	41.	45.	42.	44.	48.	38.
202	47.	30.	33.	31.	30.	40.	33.
203	47.	42.	45.	51.	34.	45.	42.
204	45.	43.	42.	40.	35.	45.	40.
205	47.	44.	41.	50.	37.	49.	38.
206	68.	28.	37.	34.	20.	33.	42.
207	98.	34.	28.	30.	28.	20.	20.
208	64.	33.	33.	27.	34.	34.	34.
209	70.	35.	34.	38.	32.	47.	33.

210	100.	48.	54.	57.	07.	49.	54.
211	84.	42.	31.	07.	01.	45.	07.
212	45.	30.	26.	41.	20.	32.	23.
213	01.	40.	12.	07.	00.	46.	45.
214	03.	28.	45.	02.	21.	30.	41.
215	85.	40.	45.	50.	34.	03.	42.
216	20.	36.	34.	41.	23.	40.	50.
217	00.	43.	46.	51.	00.	50.	05.
218	42.	18.	20.	42.	30.	02.	40.
219	43.	30.	40.	13.	00.	01.	12.
220	40.	40.	46.	07.	03.	40.	50.
221	100.	00.	54.	46.	00.	40.	50.

1	46,00	2,00	2,00
2	50,00	1,00	3,00
3	51,00	4,00	3,00
4	53,00	0,00	11,00
5	50,00	2,00	11,00
6	55,00	2,00	15,00
7	56,00	2,00	17,00
8	57,00	1,00	18,00
9	58,00	2,00	20,00
10	50,00	1,00	21,00
11	60,00	4,00	27,00
12	61,00	1,00	30,00
13	62,00	1,00	31,00
14	63,00	3,00	33,00
15	60,00	4,00	38,00
16	65,00	5,00	43,00
17	66,00	4,00	51,00
18	67,00	3,00	65,00
19	68,00	6,00	61,00
20	69,00	4,00	65,00
21	70,00	6,00	71,00
22	71,00	6,00	77,00
23	72,00	6,00	82,00
24	73,00	1,00	83,00
25	74,00	6,00	80,00
26	75,00	6,00	97,00
27	76,00	6,00	103,00
28	77,00	0,00	110,00
29	78,00	4,00	116,00
30	70,00	2,00	118,00
31	80,00	2,00	120,00
32	81,00	3,00	121,00
33	82,00	4,00	127,00
34	83,00	5,00	132,00
35	80,00	3,00	136,00
36	85,00	6,00	141,00
37	86,00	5,00	144,00
38	87,00	6,00	150,00
39	88,00	6,00	160,00
40	80,00	4,00	160,00
41	90,00	3,00	167,00
42	91,00	2,00	168,00
43	92,00	3,00	172,00
44	93,00	7,00	170,00
45	95,00	4,00	181,00
46	96,00	6,00	180,00
47	97,00	1,00	180,00
48	98,00	3,00	191,00
49	90,00	7,00	200,00
50	100,00	4,00	200,00
51	101,00	1,00	206,00
52	102,00	2,00	207,00
53	103,00	3,00	210,00
54	104,00	3,00	214,00
55	105,00	1,00	210,00
56	106,00	4,00	214,00
57	110,00	2,00	220,00
58	111,00	1,00	221,00

ANALYSIS OF VARIANCE TABLE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEANSQUARES	VARIANCE RATIO
EXPLANATION	SUM OF SQUARES	DOF	MEANSQUARES	VARIANCE RATIO
TREATMENT	1710.1523	109	15.684	60.6522
REMAINING	217.0105	12780	0.1697	

RELIABILITY OF THE TEST

1. SPLIT HALF RELIABILITY

ORD-LEVEL SPLIT	0.8083
RANDOM HALF SPLIT	0.5822
START-SECTION HALF	0.7778

2. REPEATED ADMIN VARI TEST RELIABILITY

ORD-LEVEL SPLIT	0.8083
RANDOM HALF SPLIT	0.7281
START-SECTION HALF	0.8745

3. KRONECKER FORMULA OF RELIABILITY

ORD-LEVEL SPLIT	0.8083
RANDOM HALF SPLIT	0.7281
START-SECTION HALF	0.8745

4. FLANAGAN FORMULA OF RELIABILITY

ORD-LEVEL SPLIT	0.8083
RANDOM HALF SPLIT	0.7281
START-SECTION HALF	0.8745

RELIABILITY BY MUTUAL CORRELATION METHOD 0.8083

RELIABILITY BY KR-20 FORMULA	0.8789
KR-20 FROM KRONECKER 20 VAR AND 20 VAR	0.8789
RELIABILITY BY KR-20 FORMULA	0.8083
RELIABILITY BY KR-20 FORMULA	0.8789
LOWER BOUND ESTIMATE OF EVAN RELIABILITY	0.8083
STANLEY APPROXIMATION	0.8083
THEORY OF MEASUREMENT EFFICIENCY	0.8083

RELIABILITY BY ANALYSIS OF VAR. 0.8789

TURKIN MODIFIED KR-20 FORM. 0.8789

QUESTION ANALYSIS TABLE

Qn.	ON	YCHOOSTIC	MEAN	ABILITY	FACILITY	DISCRIMINATION	VARIANCE
NO	QUESTION		INDEX				

1	100,0000	34,5118	0,4928	0,201300	0,200135
2	100,0000	35,0118	0,4976	0,201776	0,200135
3	100,0000	35,5124	0,5024	0,202461	0,200135
4	100,0000	36,0129	0,5073	0,203146	0,200135
5	100,0000	36,5131	0,5121	0,203831	0,200135
6	100,0000	37,0136	0,5170	0,204516	0,200135
7	100,0000	37,5141	0,5218	0,205201	0,200135
8	100,0000	38,0146	0,5267	0,205886	0,200135
9	100,0000	38,5151	0,5315	0,206571	0,200135
10	100,0000	39,0156	0,5364	0,207256	0,200135
11	100,0000	39,5161	0,5412	0,207941	0,200135
12	100,0000	40,0166	0,5461	0,208626	0,200135
13	100,0000	40,5171	0,5509	0,209311	0,200135
14	100,0000	41,0176	0,5558	0,210000	0,200135
15	100,0000	41,5181	0,5606	0,210685	0,200135
16	100,0000	42,0186	0,5655	0,211370	0,200135
17	100,0000	42,5191	0,5703	0,212055	0,200135
18	100,0000	43,0196	0,5752	0,212740	0,200135
19	100,0000	43,5201	0,5800	0,213425	0,200135
20	100,0000	44,0206	0,5849	0,214110	0,200135
21	100,0000	44,5211	0,5897	0,214795	0,200135
22	100,0000	45,0216	0,5946	0,215480	0,200135
23	100,0000	45,5221	0,5994	0,216165	0,200135
24	100,0000	46,0226	0,6043	0,216850	0,200135
25	100,0000	46,5231	0,6091	0,217535	0,200135
26	100,0000	47,0236	0,6140	0,218220	0,200135
27	100,0000	47,5241	0,6188	0,218905	0,200135
28	100,0000	48,0246	0,6237	0,219590	0,200135
29	100,0000	48,5251	0,6285	0,220275	0,200135
30	100,0000	49,0256	0,6334	0,220960	0,200135
31	100,0000	49,5261	0,6382	0,221645	0,200135
32	100,0000	50,0266	0,6431	0,222330	0,200135
33	100,0000	50,5271	0,6479	0,223015	0,200135
34	100,0000	51,0276	0,6528	0,223700	0,200135
35	100,0000	51,5281	0,6576	0,224385	0,200135
36	100,0000	52,0286	0,6625	0,225070	0,200135
37	100,0000	52,5291	0,6673	0,225755	0,200135
38	100,0000	53,0296	0,6722	0,226440	0,200135
39	100,0000	53,5301	0,6770	0,227125	0,200135
40	100,0000	54,0306	0,6819	0,227810	0,200135
41	100,0000	54,5311	0,6867	0,228495	0,200135
42	100,0000	55,0316	0,6916	0,229180	0,200135
43	100,0000	55,5321	0,6964	0,229865	0,200135
44	100,0000	56,0326	0,7013	0,230550	0,200135
45	100,0000	56,5331	0,7061	0,231235	0,200135
46	100,0000	57,0336	0,7110	0,231920	0,200135
47	100,0000	57,5341	0,7158	0,232605	0,200135
48	100,0000	58,0346	0,7207	0,233290	0,200135
49	100,0000	58,5351	0,7255	0,233975	0,200135
50	100,0000	59,0356	0,7304	0,234660	0,200135
51	100,0000	59,5361	0,7352	0,235345	0,200135
52	100,0000	60,0366	0,7401	0,236030	0,200135
53	100,0000	60,5371	0,7449	0,236715	0,200135
54	100,0000	61,0376	0,7498	0,237400	0,200135
55	100,0000	61,5381	0,7546	0,238085	0,200135

57	100,0000	70,0050	0,0075	0,155001	0,100120
58	100,0000	07,1357	0,5070	0,427110	0,200001
59	100,0000	30,1602	0,5000	0,100001	0,200072
60	100,0000	06,0000	0,7712	0,300000	0,100010
61	100,0000	02,2000	0,0015	0,300001	0,200072
62	100,0000	05,7330	0,7707	0,201100	0,100010
63	100,0000	00,1120	0,0000	0,000000	0,200000
64	100,0000	70,0000	0,5000	0,000001	0,200000
65	100,0000	21,0000	0,2000	0,000001	0,100000
66	100,0000	00,0000	0,7000	0,200000	0,100000
67	100,0000	20,0000	0,3000	0,000000	0,200000
68	100,0000	10,0000	0,2000	0,150000	0,150000
69	100,0000	00,0000	0,0000	0,201100	0,201100
70	100,0000	10,0000	0,2000	0,000000	0,100000
71	100,0000	01,0000	0,7000	0,500000	0,100000
72	100,0000	00,0000	0,5000	0,000000	0,200000
73	100,0000	01,0000	0,5000	0,000000	0,200000
74	100,0000	01,0000	0,5000	0,000000	0,200000
75	100,0000	01,0000	0,5000	0,000000	0,200000
76	100,0000	01,0000	0,5000	0,000000	0,200000
77	100,0000	01,0000	0,5000	0,000000	0,200000
78	100,0000	01,0000	0,5000	0,000000	0,200000
79	100,0000	01,0000	0,5000	0,000000	0,200000
80	100,0000	01,0000	0,5000	0,000000	0,200000
81	100,0000	01,0000	0,5000	0,000000	0,200000
82	100,0000	01,0000	0,5000	0,000000	0,200000
83	100,0000	01,0000	0,5000	0,000000	0,200000
84	100,0000	01,0000	0,5000	0,000000	0,200000
85	100,0000	01,0000	0,5000	0,000000	0,200000
86	100,0000	01,0000	0,5000	0,000000	0,200000
87	100,0000	01,0000	0,5000	0,000000	0,200000
88	100,0000	01,0000	0,5000	0,000000	0,200000
89	100,0000	01,0000	0,5000	0,000000	0,200000
90	100,0000	01,0000	0,5000	0,000000	0,200000
91	100,0000	01,0000	0,5000	0,000000	0,200000
92	100,0000	01,0000	0,5000	0,000000	0,200000
93	100,0000	01,0000	0,5000	0,000000	0,200000
94	100,0000	01,0000	0,5000	0,000000	0,200000
95	100,0000	01,0000	0,5000	0,000000	0,200000
96	100,0000	01,0000	0,5000	0,000000	0,200000
97	100,0000	01,0000	0,5000	0,000000	0,200000
98	100,0000	01,0000	0,5000	0,000000	0,200000
99	100,0000	01,0000	0,5000	0,000000	0,200000
100	100,0000	01,0000	0,5000	0,000000	0,200000
101	100,0000	01,0000	0,5000	0,000000	0,200000
102	100,0000	01,0000	0,5000	0,000000	0,200000
103	100,0000	01,0000	0,5000	0,000000	0,200000
104	100,0000	01,0000	0,5000	0,000000	0,200000
105	100,0000	01,0000	0,5000	0,000000	0,200000
106	100,0000	01,0000	0,5000	0,000000	0,200000
107	100,0000	01,0000	0,5000	0,000000	0,200000
108	100,0000	01,0000	0,5000	0,000000	0,200000
109	100,0000	01,0000	0,5000	0,000000	0,200000
110	100,0000	01,0000	0,5000	0,000000	0,200000
111	100,0000	01,0000	0,5000	0,000000	0,200000
112	100,0000	01,0000	0,5000	0,000000	0,200000
113	100,0000	01,0000	0,5000	0,000000	0,200000
114	100,0000	01,0000	0,5000	0,000000	0,200000
115	100,0000	01,0000	0,5000	0,000000	0,200000
116	100,0000	01,0000	0,5000	0,000000	0,200000
117	100,0000	01,0000	0,5000	0,000000	0,200000
118	100,0000	01,0000	0,5000	0,000000	0,200000
119	100,0000	01,0000	0,5000	0,000000	0,200000
120	100,0000	01,0000	0,5000	0,000000	0,200000
121	100,0000	01,0000	0,5000	0,000000	0,200000
122	100,0000	01,0000	0,5000	0,000000	0,200000
123	100,0000	01,0000	0,5000	0,000000	0,200000
124	100,0000	01,0000	0,5000	0,000000	0,200000
125	100,0000	01,0000	0,5000	0,000000	0,200000
126	100,0000	01,0000	0,5000	0,000000	0,200000
127	100,0000	01,0000	0,5000	0,000000	0,200000
999	100,0000	01,0000	0,5000	0,000000	0,200000

128	100,0000	33,6190	0,4887	0,101695	0,242094
129	100,0000	37,7198	0,5169	0,118694	0,248838
131	100,0000	39,3575	0,2203	0,037808	0,180145
132	100,0000	39,0633	0,3983	0,027379	0,210076
133	100,0000	35,5068	0,3729	0,203500	0,201336
134	100,0000	10,1086	0,1346	0,033808	0,105329
135	100,0000	15,0095	0,1695	0,135404	0,108234
136	100,0000	13,0062	0,1410	0,118694	0,130301
137	100,0000	20,3080	0,4068	0,172801	0,220008
138	100,0000	02,5465	0,0915	0,070576	0,200955
139	100,0000	24,9995	0,2707	0,122034	0,207612
140	100,0000	16,9231	0,2173	0,155004	0,162150
141	100,0000	12,0638	0,0153	0,122034	0,237710
142	100,0000	33,0072	0,1810	0,220034	0,200054
143	100,0000	30,5075	0,1808	0,060678	0,200054
144	100,0000	26,0077	0,1051	0,172801	0,211357
145	100,0000	31,0050	0,4237	0,006780	0,200054
146	100,0000	12,2217	0,1610	0,118694	0,127020
147	100,0000	20,3388	0,1220	0,180091	0,190420
148	100,0000	21,8571	0,2712	0,271186	0,180145
149	100,0000	25,8105	0,3305	0,240037	0,213018
150	100,0000	11,0063	0,1869	0,203500	0,110003

DERIVED SCORE TABLE

S.NO. MARKS ZSCORE T-SCORE AGT-SCORE CFB-SCORE

1	111.	2.13	71.11	142.62	711.12
2	110.	2.06	70.65	141.20	706.87
3	110.	2.06	70.65	141.20	706.87
4	104.	1.80	67.00	135.98	670.88
5	104.	1.80	67.00	135.98	670.88
6	104.	1.80	67.00	135.98	670.88
7	104.	1.80	67.00	135.98	670.88
8	105.	1.73	67.12	134.65	671.24
9	104.	1.67	66.66	133.32	666.89
10	104.	1.67	66.66	133.32	666.89
11	104.	1.67	66.66	133.32	666.89
12	103.	1.60	66.00	131.00	650.00
13	103.	1.60	66.00	131.00	650.00
14	103.	1.60	66.00	131.00	650.00
15	102.	1.53	65.33	130.66	651.10
16	102.	1.53	65.33	130.66	651.10
17	101.	1.47	64.66	129.33	644.45
18	100.	1.40	64.00	128.00	640.00
19	100.	1.40	64.00	128.00	640.00
20	100.	1.40	64.00	128.00	640.00
21	100.	1.40	64.00	128.00	640.00
22	99.	1.33	63.34	126.67	633.36
23	99.	1.33	63.34	126.67	633.36
24	99.	1.33	63.34	126.67	633.36
25	99.	1.33	63.34	126.67	633.36
26	99.	1.33	63.34	126.67	633.36
27	99.	1.33	63.34	126.67	633.36
28	99.	1.33	63.34	126.67	633.36
29	98.	1.27	62.67	125.34	626.71
30	98.	1.27	62.67	125.34	626.71
31	98.	1.27	62.67	125.34	626.71
32	97.	1.20	62.01	124.01	620.06
33	96.	1.13	61.34	122.68	613.42
34	96.	1.13	61.34	122.68	613.42
35	96.	1.13	61.34	122.68	613.42
36	96.	1.13	61.34	122.68	613.42
37	96.	1.13	61.34	122.68	613.42
38	96.	1.13	61.34	122.68	613.42
39	96.	1.07	60.68	121.35	606.77
40	96.	1.07	60.68	121.35	606.77
41	96.	1.07	60.68	121.35	606.77
42	96.	1.07	60.68	121.35	606.77
43	96.	1.00	60.01	120.02	600.12
44	96.	1.00	60.01	120.02	600.12
45	96.	1.00	60.01	120.02	600.12
46	96.	1.00	60.01	120.02	600.12
47	96.	1.00	60.01	120.02	600.12
48	96.	1.00	60.01	120.02	600.12
49	96.	1.00	60.01	120.02	600.12
50	92.	0.87	58.68	117.37	586.83
51	92.	0.87	58.68	117.37	586.83
52	92.	0.87	58.68	117.37	586.83
53	91.	0.80	58.02	116.04	580.18
54	91.	0.80	58.02	116.04	580.18

45	90.	0.74	57.35	114.71	573.83
46	90.	0.74	57.35	114.71	573.83
47	90.	0.74	57.35	114.71	573.83
48	80.	0.67	56.69	113.88	566.80
49	80.	0.67	56.69	113.88	566.80
50	80.	0.67	56.69	113.88	566.80
51	80.	0.67	56.69	113.88	566.80
52	80.	0.60	56.02	112.05	560.20
53	80.	0.60	56.02	112.05	560.20
54	80.	0.60	56.02	112.05	560.20
55	80.	0.60	56.02	112.05	560.20
56	80.	0.60	56.02	112.05	560.20
57	80.	0.60	56.02	112.05	560.20
58	87.	0.54	55.36	110.72	553.50
59	87.	0.54	55.36	110.72	553.50
70	87.	0.54	55.36	110.72	553.50
71	87.	0.54	55.36	110.72	553.50
72	87.	0.54	55.36	110.72	553.50
73	87.	0.54	55.36	110.72	553.50
74	87.	0.54	55.36	110.72	553.50
75	87.	0.54	55.36	110.72	553.50
76	86.	0.07	50.69	100.30	506.05
77	86.	0.07	50.69	100.30	506.05
78	86.	0.07	50.69	100.30	506.05
79	86.	0.07	50.69	100.30	506.05
80	86.	0.07	50.69	100.30	506.05
81	86.	0.06	50.03	100.06	500.30
82	86.	0.06	50.03	100.06	500.30
83	86.	0.06	50.03	100.06	500.30
84	86.	0.06	50.03	100.06	500.30
85	86.	0.06	50.03	100.06	500.30
86	86.	0.06	50.03	100.06	500.30
87	86.	0.30	53.37	106.73	533.45
88	86.	0.30	53.37	106.73	533.45
89	86.	0.30	53.37	106.73	533.45
90	86.	0.30	53.37	106.73	533.45
91	86.	0.30	53.37	106.73	533.45
92	86.	0.30	53.37	106.73	533.45
93	86.	0.30	53.37	106.73	533.45
94	86.	0.30	53.37	106.73	533.45
95	86.	0.30	53.37	106.73	533.45
96	86.	0.30	53.37	106.73	533.45
97	86.	0.30	53.37	106.73	533.45
98	86.	0.30	53.37	106.73	533.45
99	86.	0.30	53.37	106.73	533.45
100	86.	0.30	53.37	106.73	533.45
101	86.	0.30	53.37	106.73	533.45
102	86.	0.30	53.37	106.73	533.45
103	86.	0.30	53.37	106.73	533.45
104	86.	0.30	53.37	106.73	533.45
105	86.	0.30	53.37	106.73	533.45
106	86.	0.30	53.37	106.73	533.45
107	86.	0.30	53.37	106.73	533.45
108	86.	0.30	53.37	106.73	533.45
109	86.	0.30	53.37	106.73	533.45
110	86.	0.30	53.37	106.73	533.45
111	86.	0.30	53.37	106.73	533.45
112	86.	0.30	53.37	106.73	533.45
113	86.	0.30	53.37	106.73	533.45
114	86.	0.30	53.37	106.73	533.45
115	86.	0.30	53.37	106.73	533.45
116	86.	0.30	53.37	106.73	533.45
117	86.	0.30	53.37	106.73	533.45
118	86.	0.30	53.37	106.73	533.45
119	86.	0.30	53.37	106.73	533.45
120	86.	0.30	53.37	106.73	533.45
121	86.	0.30	53.37	106.73	533.45
122	86.	0.30	53.37	106.73	533.45
123	86.	0.30	53.37	106.73	533.45
124	86.	0.30	53.37	106.73	533.45
125	86.	0.30	53.37	106.73	533.45
126	86.	0.30	53.37	106.73	533.45

127	75.	-0.20	47.34	90.77	073.83
128	75.	-0.20	47.34	90.77	073.83
129	75.	-0.20	47.34	90.77	073.83
130	75.	-0.20	47.34	90.77	073.83
131	75.	-0.20	47.34	90.77	073.83
132	75.	-0.20	47.34	90.77	073.83
133	75.	-0.11	44.72	91.00	067.10
134	75.	-0.11	44.72	91.00	067.10
135	75.	-0.11	44.72	91.00	067.10
136	75.	-0.11	44.72	91.00	067.10
137	75.	-0.11	44.72	91.00	067.10
138	75.	-0.11	44.72	91.00	067.10
139	75.	-0.10	44.04	92.11	060.50
140	75.	-0.04	45.10	90.78	055.80
141	75.	-0.04	45.10	90.78	055.80
142	75.	-0.04	45.10	90.78	055.80
143	75.	-0.04	45.10	90.78	055.80
144	75.	-0.06	45.10	90.78	055.80
145	75.	-0.03	47.72	89.05	037.24
146	75.	-0.03	48.72	89.04	047.24
147	75.	-0.03	48.72	89.05	047.24
148	75.	-0.03	48.72	89.05	047.24
149	75.	-0.03	48.72	89.05	047.24
150	75.	-0.03	48.72	89.05	047.24
151	75.	-0.04	48.04	88.13	040.60
152	75.	-0.04	48.04	88.13	040.60
153	75.	-0.04	48.04	88.13	040.60
154	75.	-0.04	48.04	88.13	040.60
155	75.	-0.04	48.04	88.13	040.60
156	75.	-0.04	48.04	88.13	040.60
157	80.	-0.04	43.80	88.70	033.04
158	80.	-0.06	45.80	88.70	033.04
159	80.	-0.04	43.80	88.70	033.04
160	80.	-0.04	43.80	88.70	033.04
161	80.	-0.71	42.73	85.04	027.31
162	80.	-0.71	42.73	85.04	027.31
163	80.	-0.71	42.73	85.04	027.31
164	80.	-0.71	42.73	85.04	027.31
165	80.	-0.71	42.73	85.04	027.31
166	80.	-0.71	42.73	85.04	027.31
167	87.	-0.70	42.07	81.13	020.40
168	87.	-0.70	42.07	81.13	020.40
169	87.	-0.70	42.07	81.13	020.40
170	87.	-0.70	42.07	81.13	020.40
171	80.	-0.84	41.80	82.80	010.01
172	80.	-0.80	41.80	82.80	010.01
173	80.	-0.84	41.80	82.80	010.01
174	80.	-0.80	41.80	82.80	010.01
175	80.	-0.84	41.80	82.80	010.01
176	80.	-0.80	41.80	82.80	010.01
177	80.	-0.84	41.80	82.80	010.01
178	80.	-0.80	41.80	82.80	010.01
179	85.	-0.03	40.74	81.07	007.37
180	85.	-0.03	40.74	81.07	007.37
181	85.	-0.03	40.74	81.07	007.37
182	85.	-0.03	40.74	81.07	007.37
183	85.	-0.03	40.74	81.07	007.37
184	85.	-0.00	40.07	80.14	000.72
185	85.	-0.00	40.07	80.14	000.72
186	80.	-0.00	40.07	80.14	000.72
187	80.	-0.00	40.07	80.14	000.72
188	83.	-1.04	30.01	78.81	000.07
189	83.	-1.04	30.01	78.81	000.07
190	83.	-1.04	30.01	78.81	000.07
191	87.	-1.14	38.74	77.09	007.35
192	81.	-1.10	38.08	78.14	000.78
193	81.	-1.10	38.08	78.14	000.78
194	81.	-1.10	38.08	78.14	000.78
195	80.	-1.20	37.01	70.83	070.14
196	80.	-1.20	37.01	70.83	070.14
197	80.	-1.20	37.01	70.83	070.14
198	80.	-1.20	37.01	70.83	070.14

740	50.	-1,34	34,75	73,50	367,40
200	50.	-1,33	34,75	73,50	367,40
201	50.	-1,33	34,75	73,50	367,40
202	50.	-1,30	34,08	72,17	360,49
203	50.	-1,30	34,08	72,17	360,49
204	47.	-1,08	35,07	70,80	350,19
205	46.	-1,52	30,75	69,51	347,54
206	46.	-1,52	30,75	69,51	347,54
207	45.	-1,50	30,00	68,18	340,70
208	45.	-1,50	30,00	68,18	340,70
209	40.	-1,68	33,04	66,85	330,26
210	40.	-1,68	33,04	66,85	330,26
211	43.	-1,72	32,76	65,52	327,61
212	43.	-1,72	32,76	65,52	327,61
213	43.	-1,72	32,76	65,52	327,61
214	43.	-1,72	32,76	65,52	327,61
215	51.	-1,08	33,04	67,80	330,31
216	51.	-1,08	33,04	67,80	330,31
217	51.	-1,08	33,04	67,80	330,31
218	51.	-1,08	33,04	67,80	330,31
219	50.	-1,02	30,77	61,54	307,67
220	66.	-2,19	28,11	56,22	281,08
221	66.	-2,19	28,11	56,22	281,08